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Case Report

Mushroom Hypersensitivity Manifested as Cluster Headache - First Case Report

Zapata Valeria[1], Abreu Steven[1], Aguirre Natalia[1] and Ricardo Cardona[1,2*]

[1]Clinical and Experimental Allergology Group (GACE), University of Antioquia, Medellín, Colombia

[2]Clinical Allergology Unit, Medellín, Colombia

***Address for Correspondence:** Ricardo Cardona, Clinical and Experimental Allergology Group (GACE) and Clinical Allergology Unit, Medellín, Colombia, Tel: +573108216015; E-mail: rcv2016udea@gmail.com

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Abstract

Background: An adverse reaction to food is any clinically abnormal response that can be attributed to its ingestion, contact with it or inhalation of it, its components or one of its additives. A cluster headache is a type of trigeminal autonomic headache. Although it has been associated with factors such as alcohol intake, smoking and the consumption of certain foods.

Case: A woman consulted to the allergologist for presenting an adverse reaction following the ingestion of mushrooms (*Agaricus bisporus*). The case was initially thought to be a hypersensitivity reaction. Allergen-Specific IgE was measured and a prick by prick test was performed with *Agaricus bisporus*, both of which were negative. An oral challenge was carried out, which evoked symptoms compatible with a cluster headache.

Conclusions: a cluster headache can be a differential diagnosis in allergology, given that its characteristics may resemble a late allergic reaction. In this case report, a cluster headache is thought to be mediated by histamine released after the ingestion of *Agaricus bisporus*.

Keywords: Food hypersensitivity, Mushroom, Cluster headache, Histamine, *Agaricus bisporus*

Background

An adverse reaction to food is any clinically abnormal response that can be attributed to its ingestion, contact with it or inhalation of it, its components or one of its additives [1]. Food allergy has a prevalence of 0.1% to 6% while the prevalence of adverse reactions to food is estimated at 30% in the general population [2,3]. The clinical manifestations are diverse which may lead to a late diagnosis. Cluster headache is a type of trigeminal autonomic headache, its etiology hasn't been fully understood, although it has been associated with factors such as alcohol intake, smoking and consumption of certain foods, especially those rich in nitrates [4].

Case Presentation

Our patient is a 43-year-old woman with a history of face flushing, nausea and right hemicrania continua predominantly in the supraciliary region minutes after the ingestion of mushrooms (Agaricus bisporus). The day following the ingestion of mushrooms she always manifests a maculopapular rash in the malar region, accompanied by a burning sensation, conjunctival injection and ipsilateral rhinorrhea, without pruritus. She has had 4 similar episodes in her life, all of them following the ingestion of mushrooms. We initially suspected an allergic reaction and serum quantification of Allergen-Specific IgE for mushroom was measured. The result was <0.1 KU / L (class 0). A prick by prick test with mushroom was performed, which was also negative.

An oral challenge test was performed with mushroom, which the patient consumed two hours before the scheduled appointment. At 8:15am she arrived at the allergy clinic in optimal conditions. Given the fact that the patient had already ingested a small amount of mushroom, no additional challenge was performed, and she was admitted for observation. One hour later, she presented epiphora, nasal congestion and right hemicrania continua with no other symptoms. Regarding her physical examination, she was hemodynamically stable and conscious, with the

following findings: right palpebral edema with chemosis and ipsilateral epiphora; anterior rhinoscopy: pale right turbinate mucosa with right nostril obstruction without rhinorrhea, sialorrhea, or mucosal lesions, erythema was observed in the nasogenial groove and right nasal tip (Figure 1). At 10:15 am she persisted symptomatic. Given that the patient met the clinical criteria for the diagnosis of cluster headache according to the International Classification of Headache (ICHD-3) [5], 10 mg of intranasal zolmitriptan were administered, which failed to control the symptoms. The patient was directed to the emergency department where oxygen and analgesics were administered. Due to the persistence of symptoms, 2 mg of intravenous clemastine were administered, leading to the immediate improvement of the symptoms.

Discussion

A cluster headache is a neurological disorder characterized by the presence of intense unilateral headache localized in the periorbital, supraorbital or temporal region. Its presentation is intermittent with episodes lasting between 15 to 180 minutes, associated with ipsilateral autonomic symptoms [6]. Although in the reviewed literature there are reported cases of foods triggering cluster headaches [7] to the best of our knowledge ours is the first report of a case triggered by mushrooms.

The pathophysiological mechanisms involve the trigeminovascular system, parasympathetic nerve fibers and the hypothalamus [8]. A genetic basis of the condition has been suspected given that first-degree relatives of the affected individual have a risk of 14 to 48 times higher of developing the disease in comparison to the general population [4]. An association has been described with some triggers such as smoking, alcohol consumption in small quantities, naps and inhalation of volatile organic compounds (perfumes and paints), and glyceryl nitrates and trinitrate which are used to induce attacks experimentally [4]. Some authors have described an association with foods, especially those containing tyramine (cheese, beans, yeast and coffee) [9].

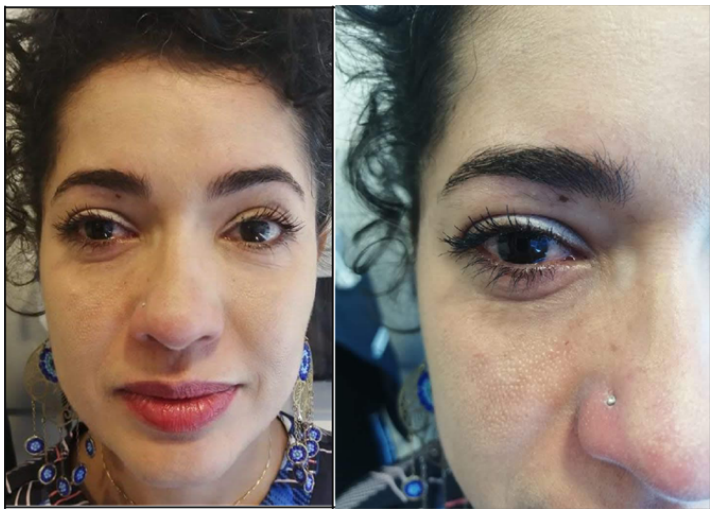

Figure 1: Cranial autonomic symptoms during a cluster headache. This photograph was taken during the oral provocation test and shows periorbital edema with chemosis, epiphora and erythema in the nasogenial groove and nasal tip

An increase in plasma histamine has been demonstrated during cluster headaches [10]. The diagnosis of cluster headaches is made using the ICHD-3 clinical criteria [5].

An adverse reaction to a food is defined according to the American Academy of Allergology, Asthma and Immunology, (AAAAI) as any abnormal clinical response, attributed to the ingestion of a particular food (or additive) that is tolerated by the vast majority of people. There are two types of adverse reactions to food:

Food allergy

An adverse reaction which occurs after the ingestion of a particular food and has an immunological cause.

Food intolerance

The clinical response to a food not mediated by an immunological mechanism. There is a genetic or epigenetic component that predisposes an individual to have such reactions. This type of reaction includes pharmacological and metabolic reactions [3].

Agaricus bisporus, is the most commonly ingested fungi species [11]. Some cases of anaphylaxis have been reported to this food [12], therefore the case was initially thought to be an allergic reaction. Serum and skin tests were performed to determine the presence of allergen specific IgE. An allergic mechanism was not demonstrated, and an oral challenge test was carried out. Based on the progression of the symptoms, the possibility of a cluster headache diagnosis was considered, the only trigger in this case was the mushroom.

An increase in serum histamine levels has been demonstrated during cluster headache episodes and it has been considered part of the pathophysiological mechanism [10] and it is well known that histamine levels rise during allergic reactions. In this case, the symptoms might be due to rise in serum histamine levels, mediated by unknown mechanisms, which triggered the development of a cluster headache. The fact that the patient's symptoms improved following a dose of an antihistamine could be in favor of this hypothesis.

Conclusion

Cluster headaches can occur in the allergy clinic as a differential diagnosis of allergic disease. The allergist has an important role in confirming the food involved through provocation tests. A possible explanation for this case report is that the cluster headache, which occurred following the ingestion of Agaricus bisporus, could have been provoked by a release of histamine. Antihistamines could therefore be considered as a therapeutic option in these cases.

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